

# MINERALOGICAL DIVERSITY OF THE AL-BEARING CLAY UNIT AT MAWRTH VALLIS: EVIDENCE FOR ACIDIC ALTERATION

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dep?? B? d? ps?p? c???

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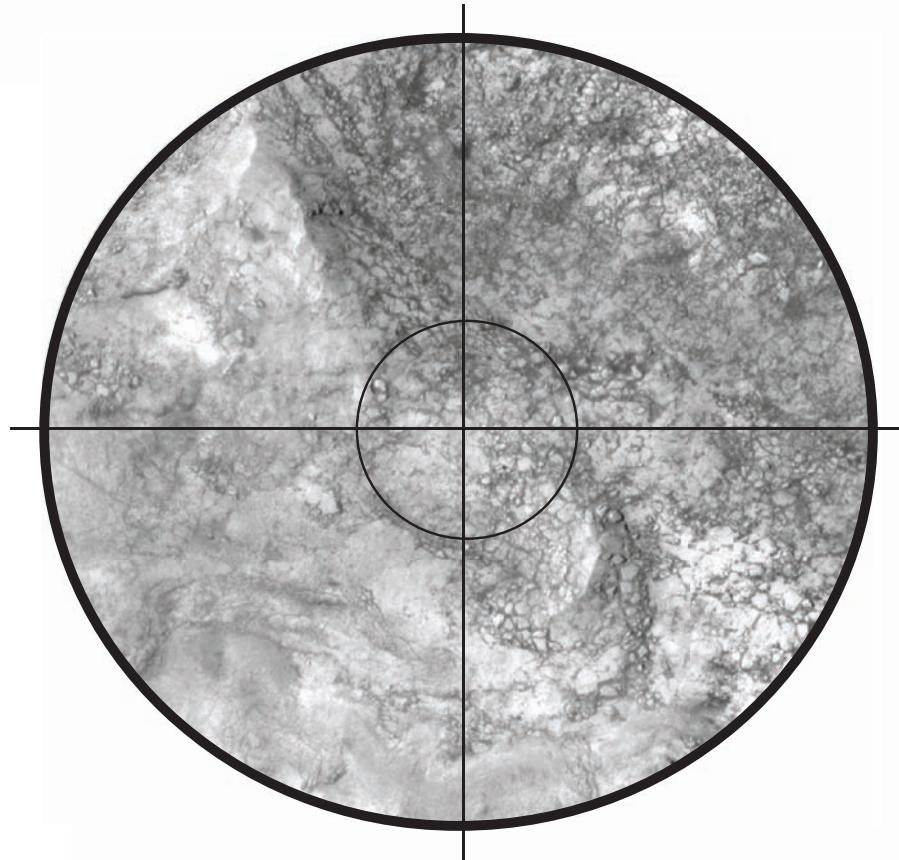
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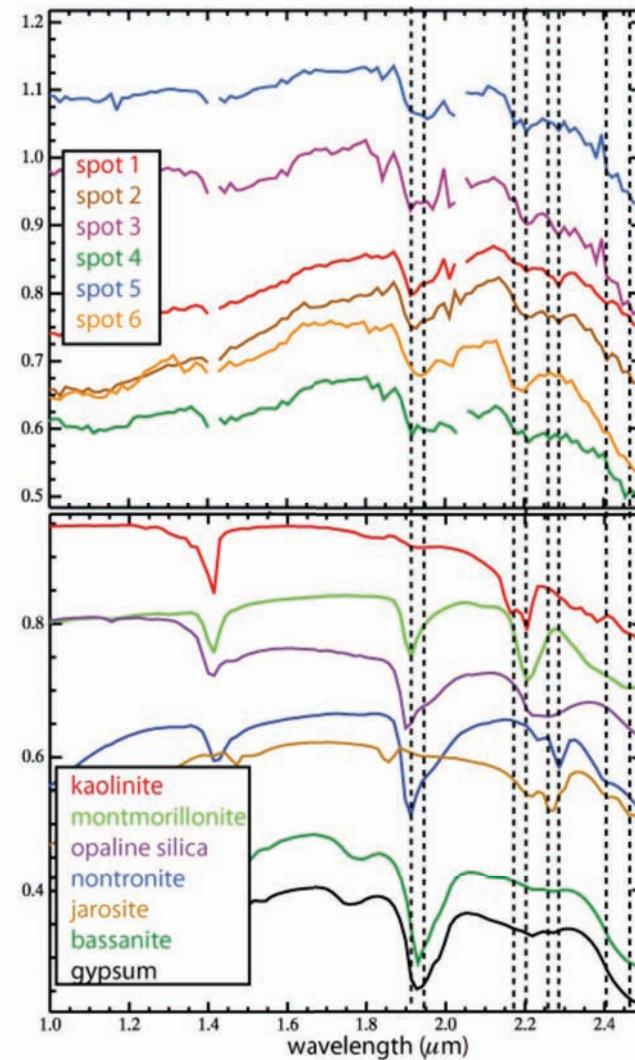
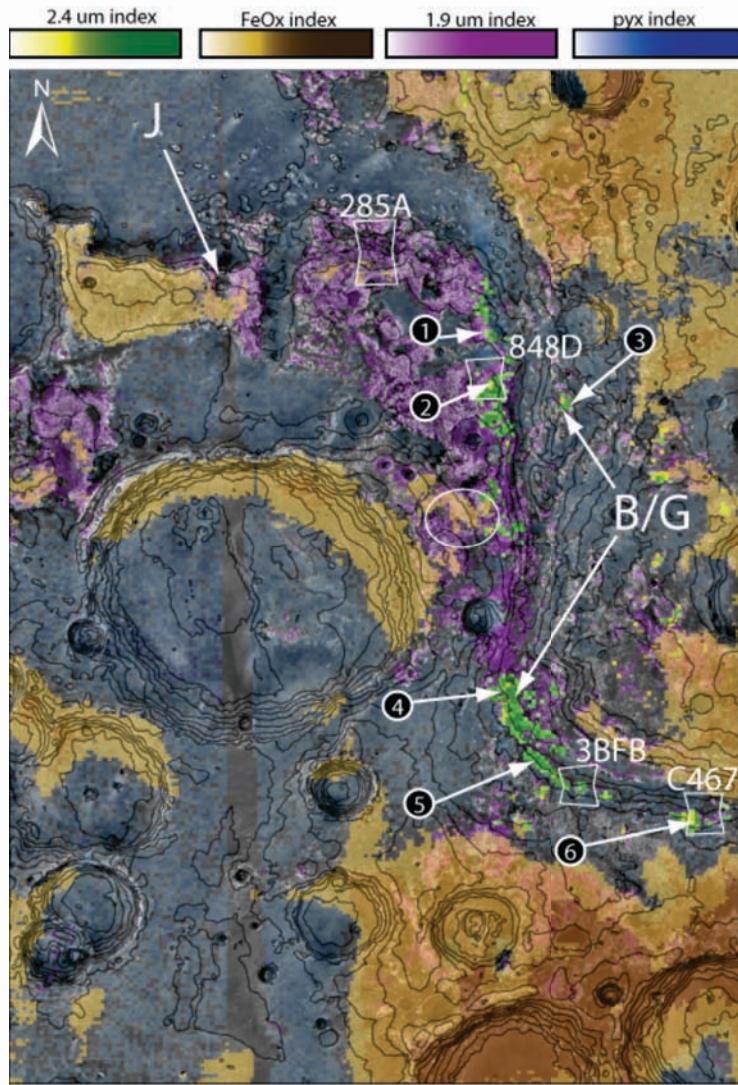
# THE GOAL: UNDERSTAND THE NATURE OF THE ALUMINOUS UNIT AND THE IMPLICATIONS FOR MSL?

- Aluminous Unit  
Growth Features  
Growth Bands

  - Growth Features  
Growth Bands
  - Wavy Growth Bands  
Wavy Growth Bands
- Aluminous Unit  
Growth Features  
Growth Bands
- Aluminous Unit  
Growth Features  
Growth Bands
- Aluminous Unit  
Growth Features  
Growth Bands

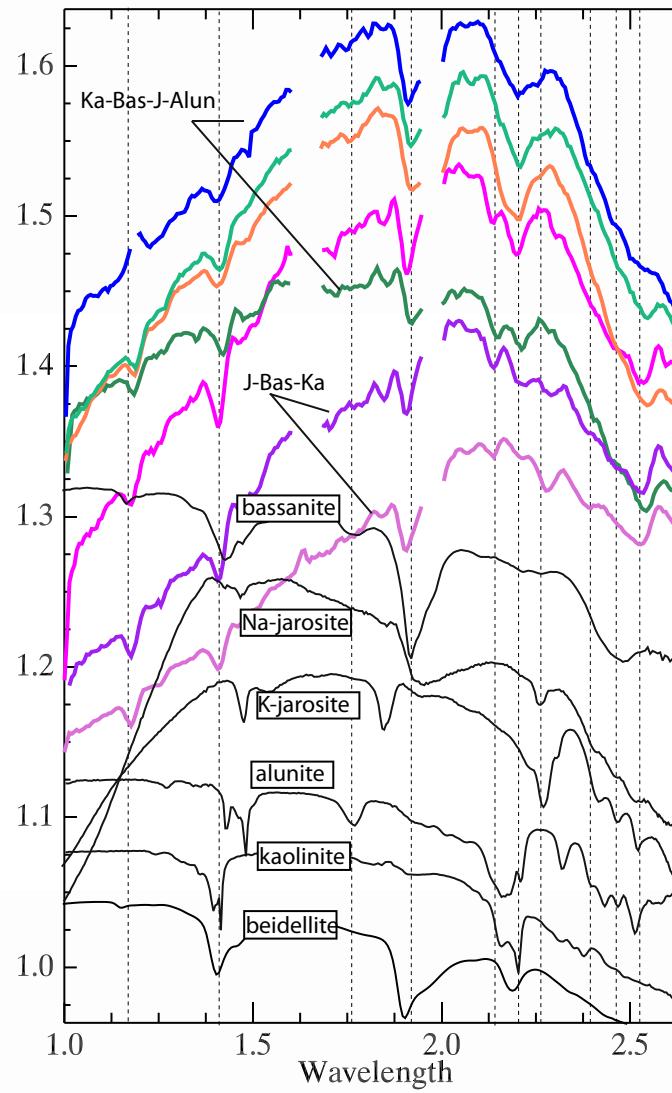
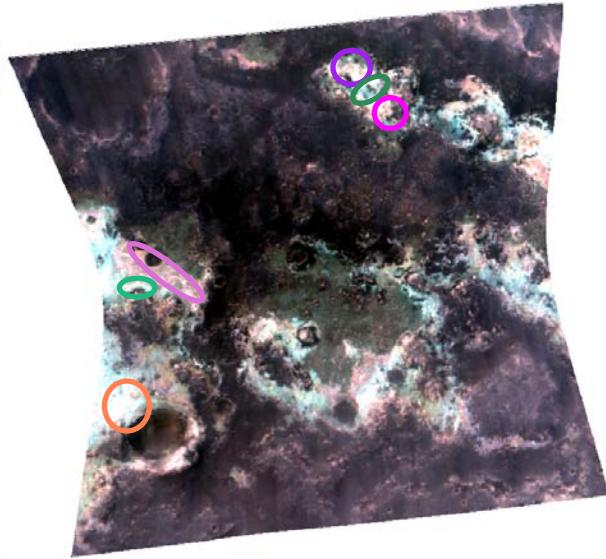


# OMEGA RESULTS?



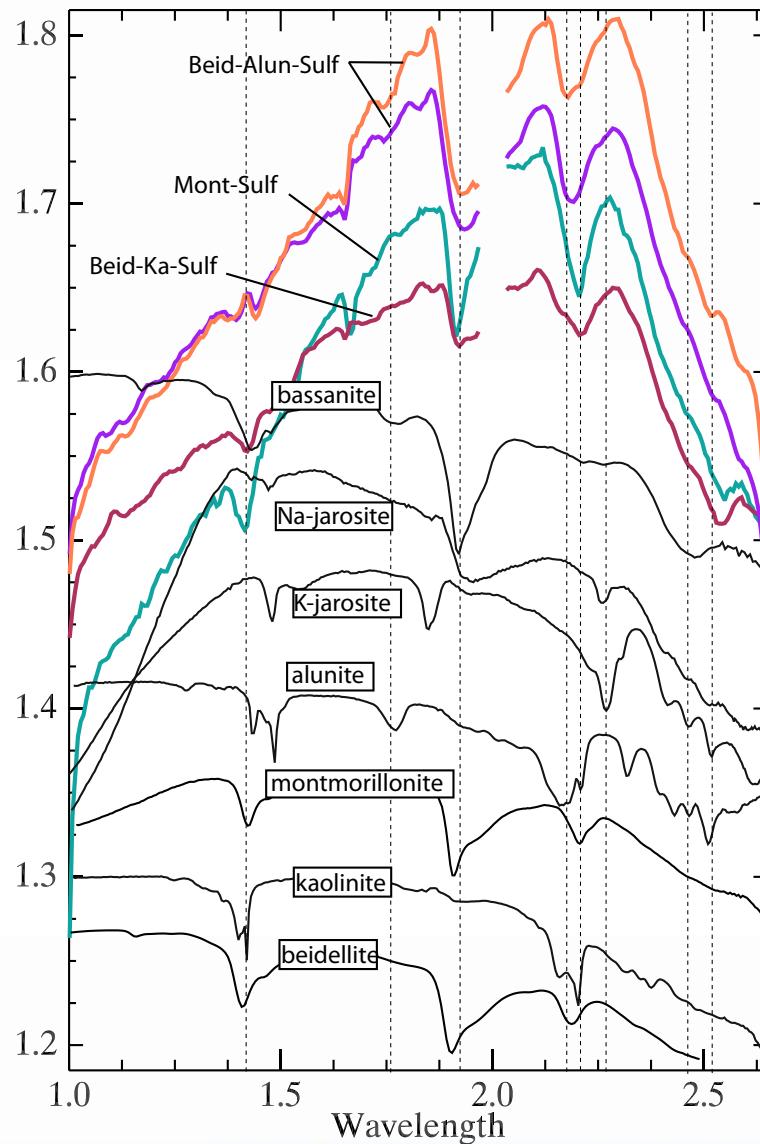
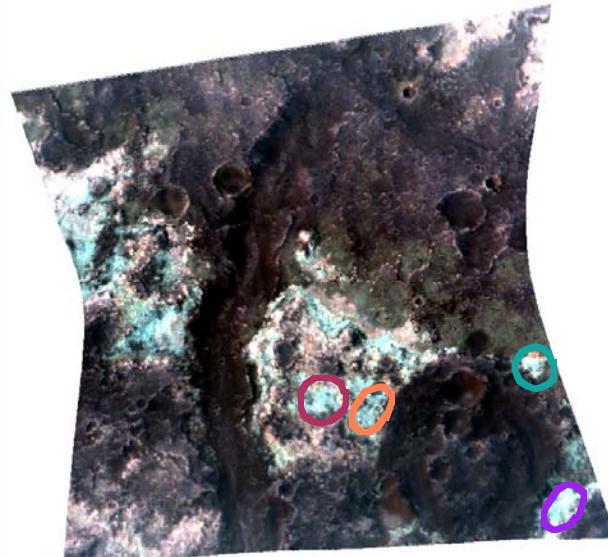
# CRISM CUBE 467C?

- f ??
- ?? f ??
- ?? ?? n? ??
- ?? Gn??
- ?? f ?? c ??



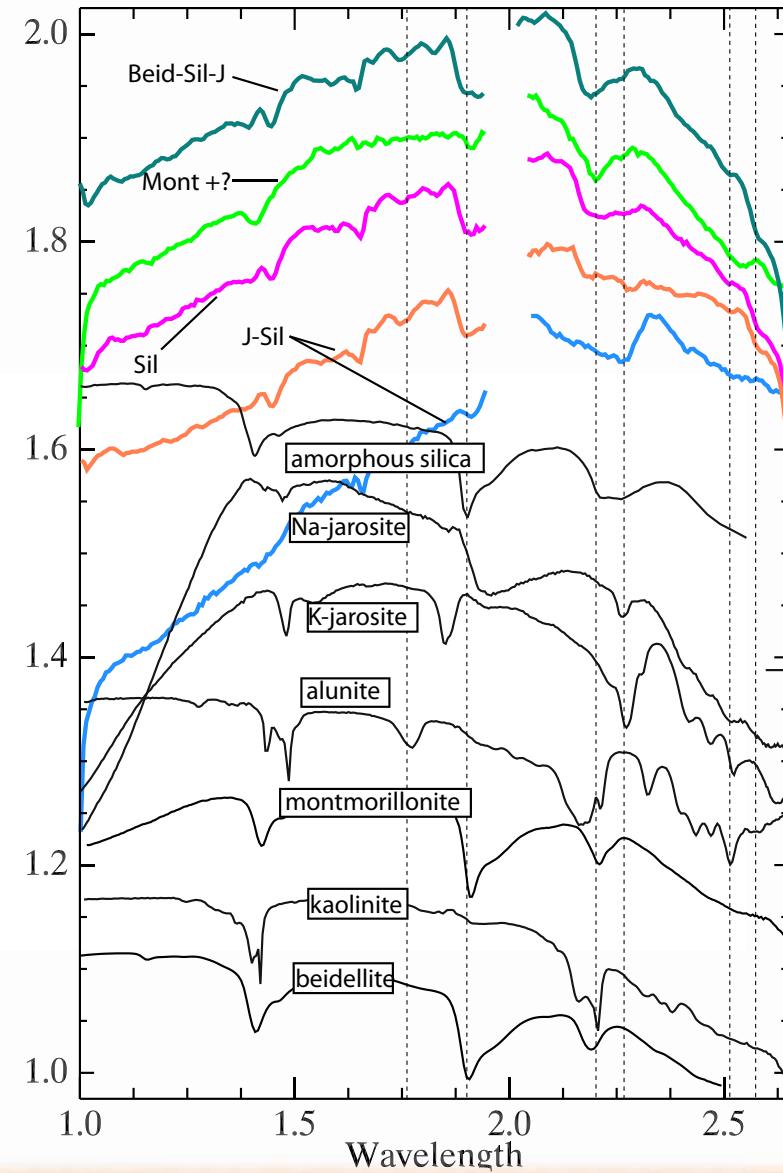
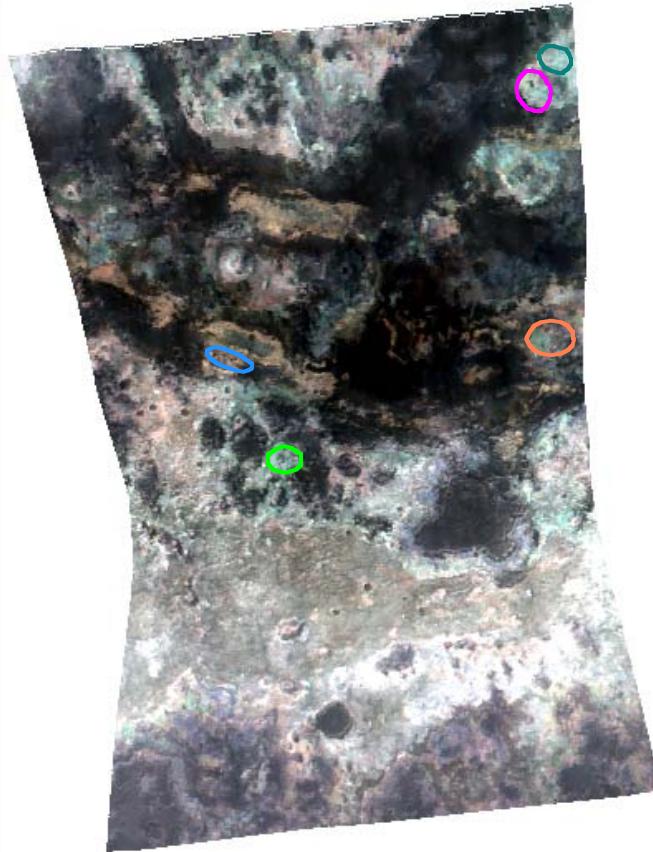
# CRISM CUBE 3BFB?

- $\text{Fe}^{+2}$  f  $\text{Mg}^{+2}$   $\text{Mn}^{+2}$ ??
- $\text{Ca}^{+2}$   $\text{Mg}^{+2}$   $\text{Mn}^{+2}$ ??
- $\text{Fe}^{+2}$   $\text{Mn}^{+2}$   $\text{Mg}^{+2}$ ??
- $\text{Fe}^{+2}$   $\text{Mg}^{+2}$   $\text{Mn}^{+2}$   $\text{Ga}^{+3}$ ??
- $\text{Fe}^{+2}$   $\text{Mg}^{+2}$   $\text{Ca}^{+2}$ ??

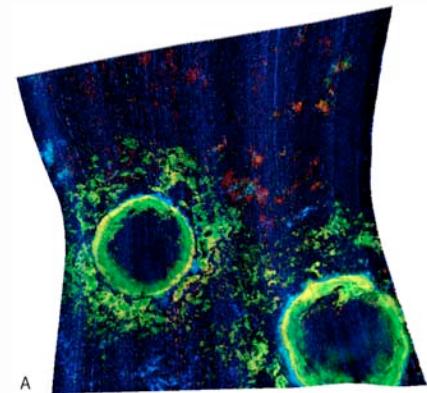
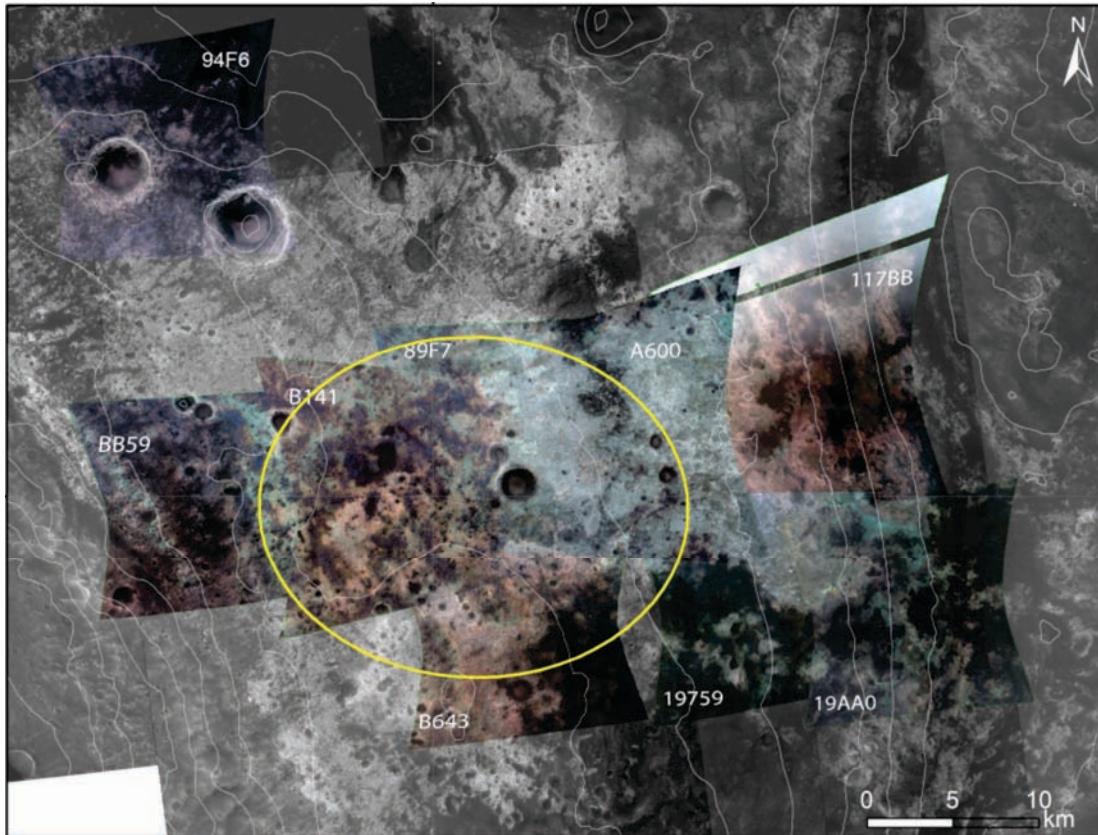


# CRISM CUBE 285A?

- **Beid-Sil-J**
- **Mont +?**
- **J-Sil**
- **Sil**
- **GpSil**
- **Gpt**
- **Gat**
- **Garn**
- **Beidellite**
- **kaolinite**
- **montmorillonite**
- **K-jarosite**
- **Na-jarosite**
- **amorphous silica**
- **alunite**

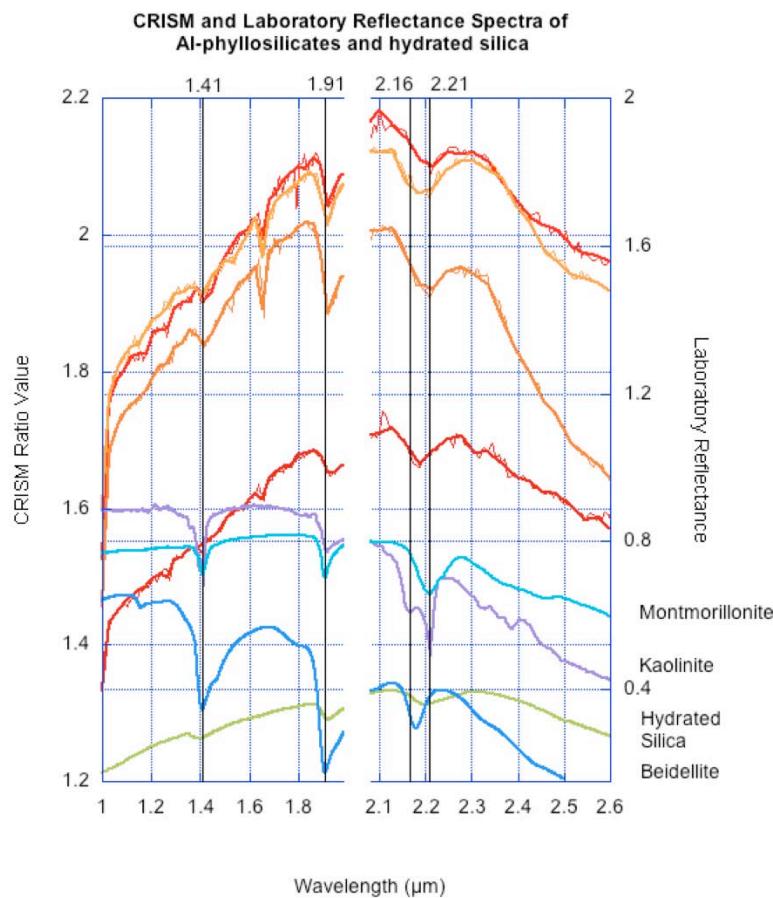


# IN AND AROUND THE ELLIPSE?

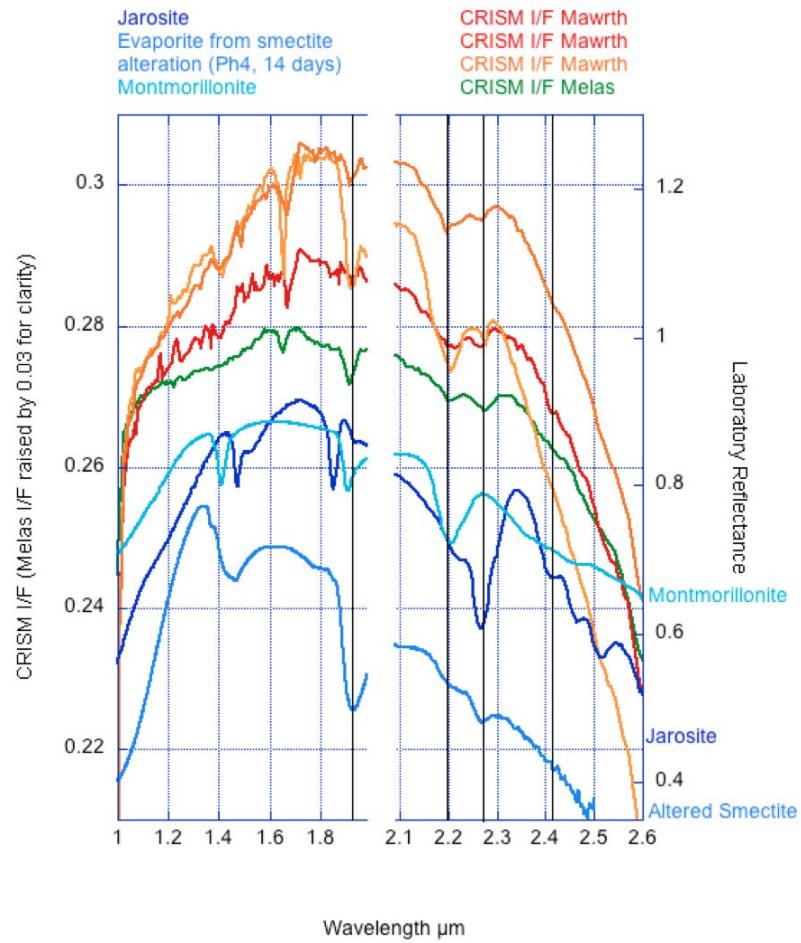


GP GP G a t se  
P E P W

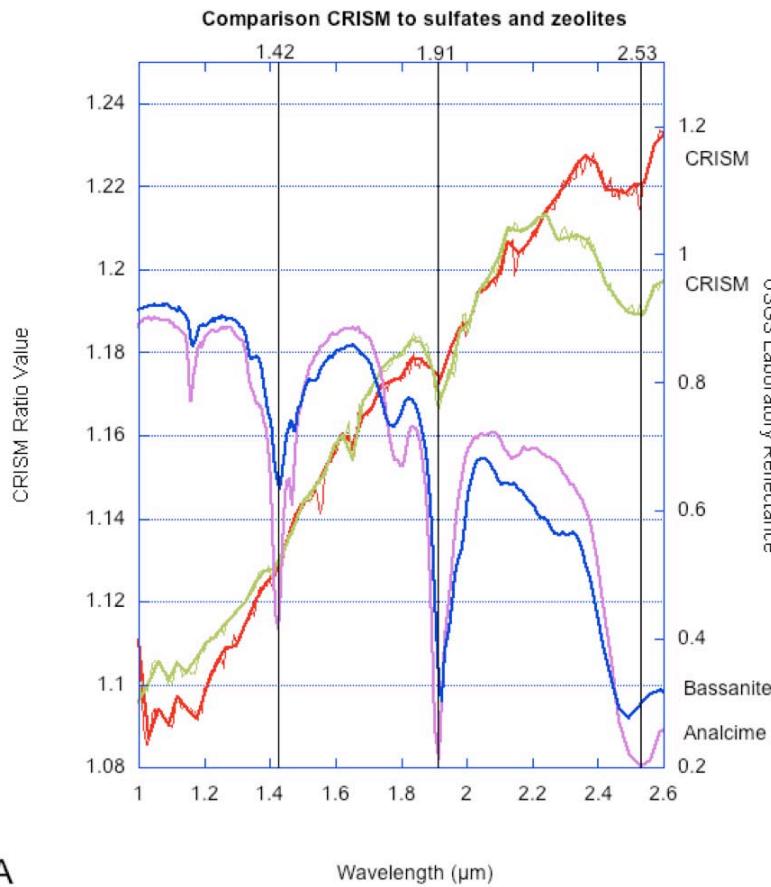
# VARIABILITY OF THE ALUMINOUS UNIT?



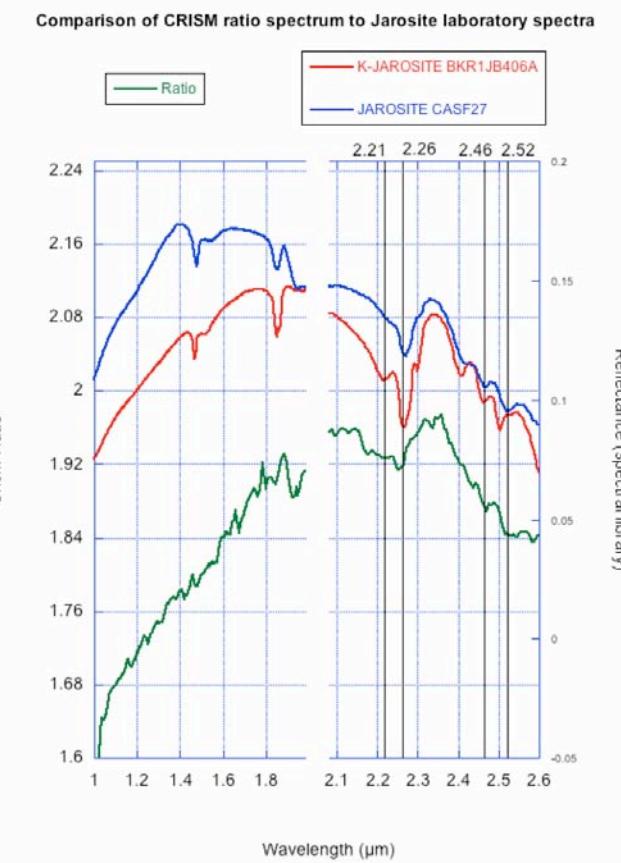
CRISM I/F of unit 4 compared to CRISM I/F of Melas and laboratory reflectance spectra smectites and acid-alteration products



# JAROSITE AND OTHER SULFATES?

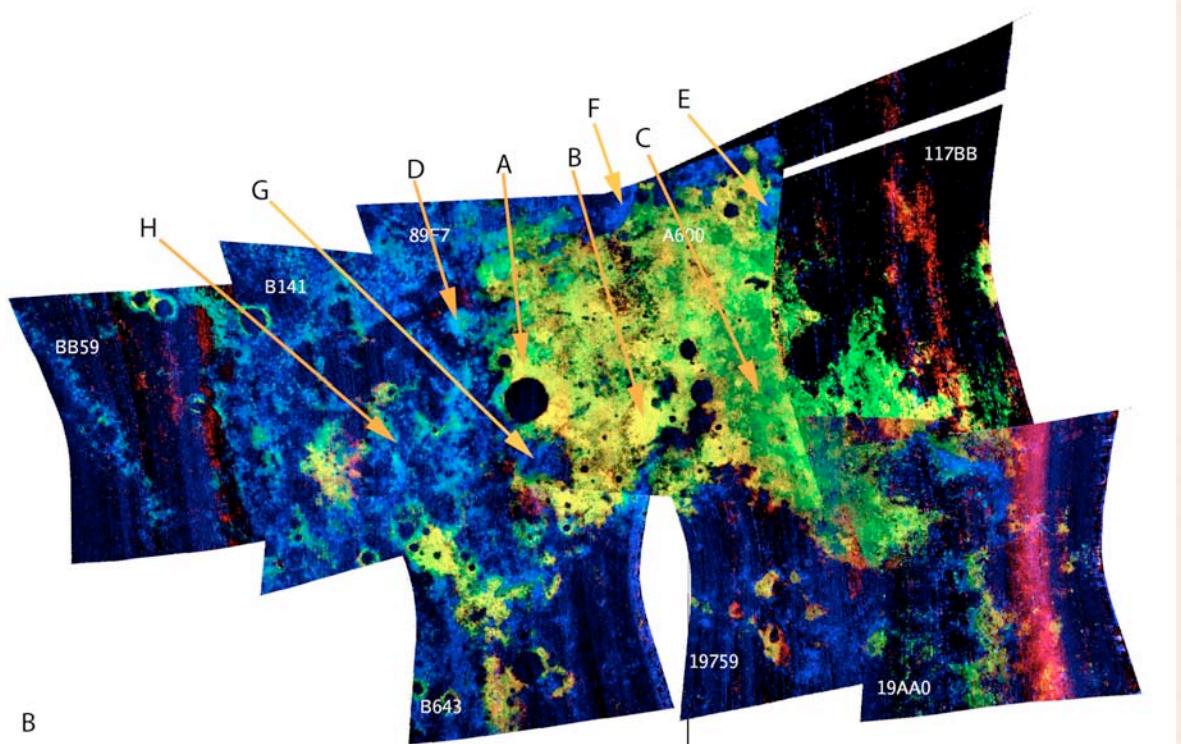
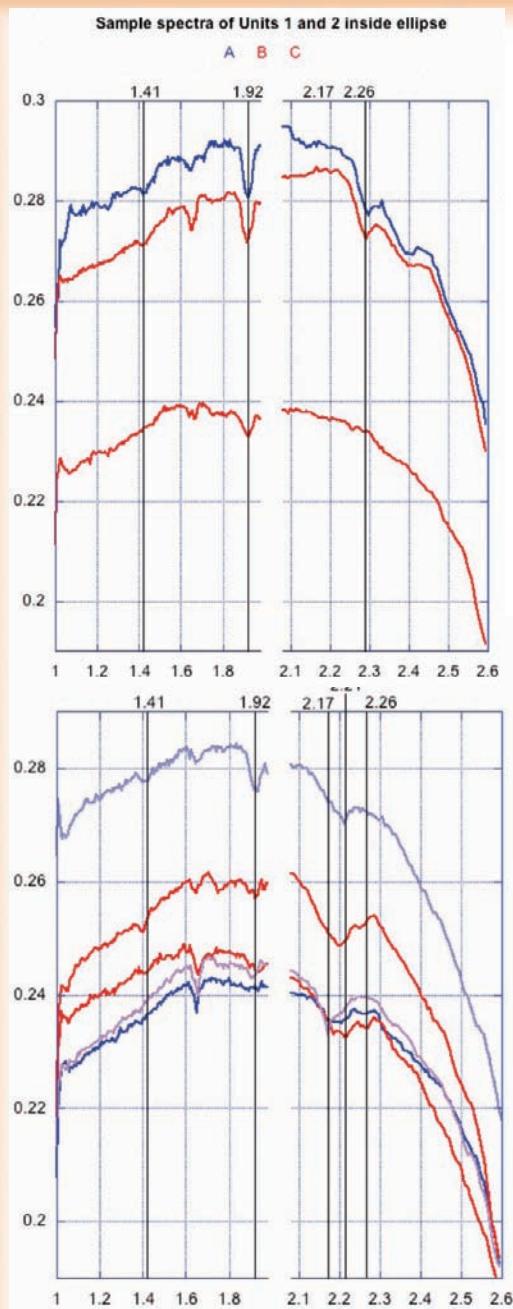


A

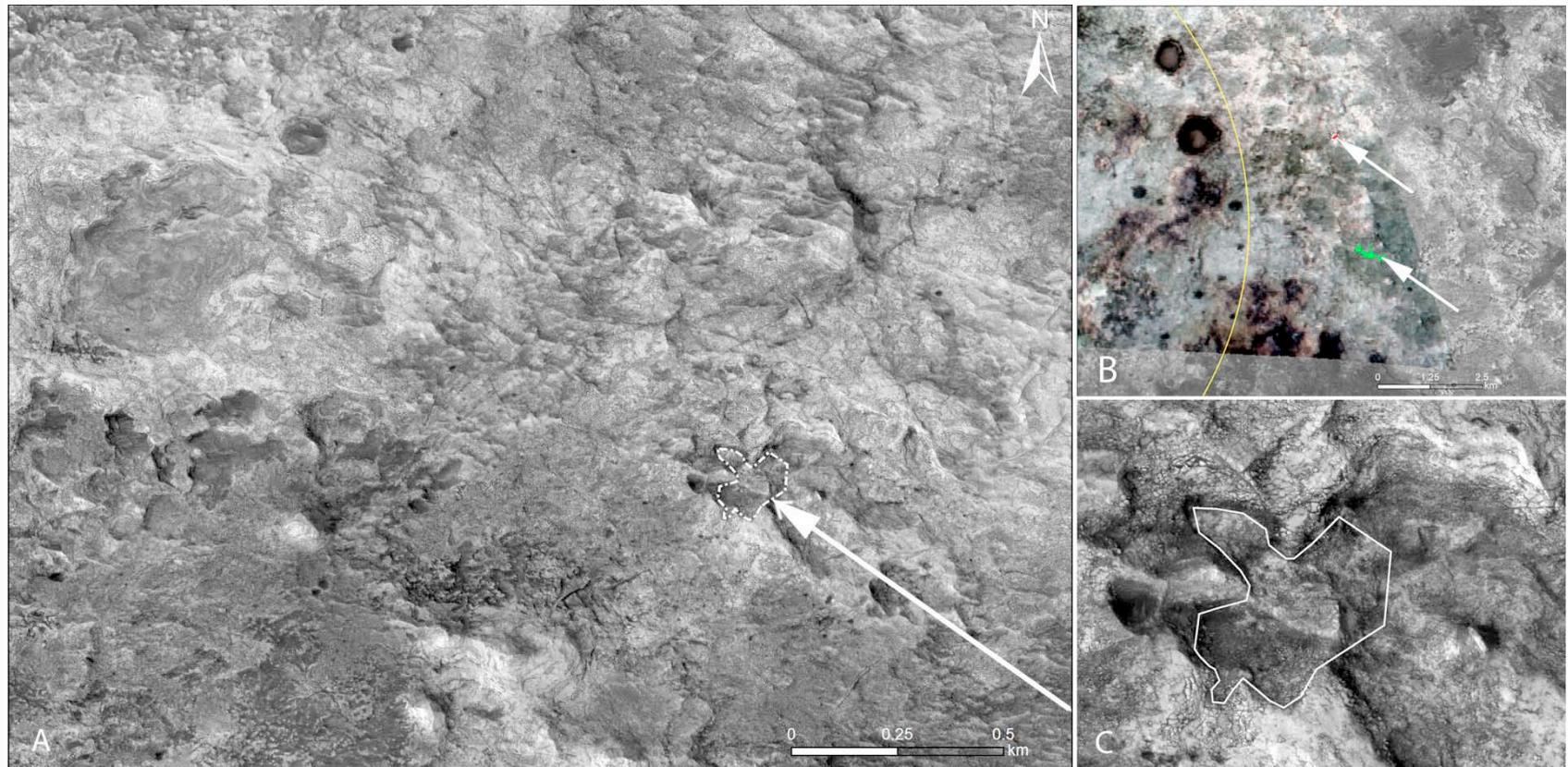


B

# DIVERSITY IN THE ELLIPSE?



# SULFATES NEXT TO THE ELLIPSE?



# MULTIPLE AQUEOUS ENVIRONMENTS?

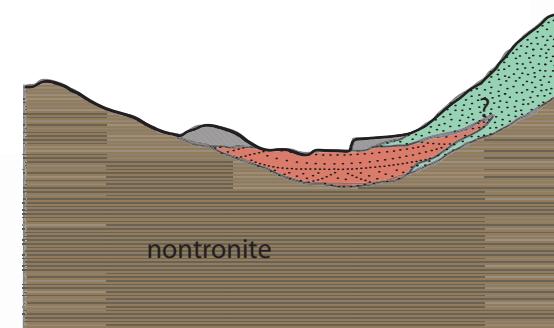
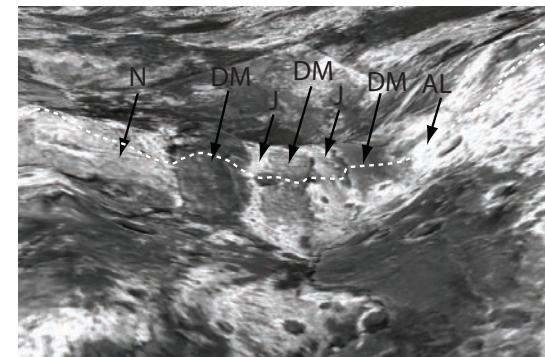
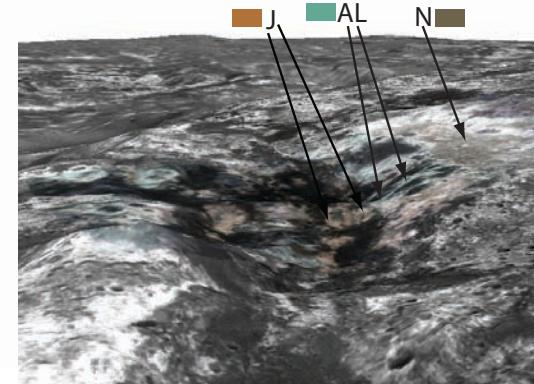
UNIT	MINERALOGY	FLUID	AGE	PROCESSES
	kaolinite beidellite silica jarosite (alunite? bassanite?) FeOx montmorillonite	neutral to strongly acidic, water-limited?	Early Hesp?	surface weath- ering, ice weathering, groundwater upwelling?
	nontronite FeOx feldspar? silica?	weakly acidic to alkaline, abun- dant water	Mid-Late Noachian	subsurface hydrothermal? submarine hydrothermal? surface weath- ering in wet, neutral condi- tions?

Process gap + time gap

# CONTEXT?

- **Q?d?se|?|?o?pp?e?p?os?**  
e?m?m?m?d?ss?| ?
- **Q?|?M?e?d?|?|?r**  
J p?h? e? e? ?  
p? M? ps?p?e ?
- **Q?d?se|?|?o?pp?**  
e?m?m?m?e?d?|?|?  
Q?ole?|?|?n? Q?o?at?p?e ?

| M? s? M? o? m?o?se?|?e?|?  
Q?h?ps|M? N?od?|?|?em?a?  
yNuuHS?



# THEMIS IR 964 DCS?

